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Marshall Star, February 15, 2012 Edition

MARSHALL STAR

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NASA Reaches Higher With FY-2013 Budget Request

NASA news release

NASA announced Feb. 13 a \$17.7 billion budget request for fiscal year 2013 supporting an ambitious program of space exploration that will build on new technologies and proven capabilities to expand America's reach into the solar system.

Despite a constrained fiscal environment, the NASA FY13 budget continues to implement the space science and exploration program agreed to by President Obama and a bipartisan majority in Congress, laying the foundation for ground-breaking discoveries here on Earth and in deep space, including new destinations, such as an asteroid and Mars by 2035.

"This budget in-sources jobs, creates capabilities here at home -- and strengthens our workforce, all while opening the next great chapter in American exploration," NASA Administrator Charles Bolden said. "And as we reach for new heights in space, we're creating new jobs right here on Earth, helping to support an economy that's built to last."

The NASA budget includes \$4 billion for space operations and \$4 billion for exploration activities in the Human Exploration Operations mission directorate, including close-out of the Space Shuttle Program, and funding for the International Space Station; \$4.9 billion for science; \$669 million for space technology; and \$552 million for aeronautics research.

"This budget puts us on course to explore farther into space than ever before, revealing the unknown and fueling the nation's economy for years to come," Deputy Administrator Lori Garver said. "We are committed to ensuring that our astronauts are once again launched from U.S. soil on American-made spacecraft, and this budget provides the funds to make this a reality."

The budget supports NASA's continued work to develop the Space Launch System, a new heavy-lift rocket to carry astronauts to destinations such as an asteroid and Mars, and the Orion crew capsule in which they will travel. Included are resources for final preparation and manufacturing milestones for Orion's 2014 Exploration Flight Test 1 and preliminary design reviews of major Space Launch System elements.

NASA has prioritized funding for its partnership with the commercial space industry to facilitate crew and cargo transport to the station. The \$830 million for this work in the FY13 budget advances progress toward a vibrant space industry that will create well-paying, high-tech jobs to the U.S. economy, and reduce America's reliance on foreign systems.

The budget also enhances use of the International Space Station to improve life on Earth and help make the next great leaps in scientific discovery and exploration.

NASA's science budget supports a balanced portfolio of innovative science missions that will reach farther into our solar system, reveal unknown aspects of our universe, and provide critical data about our home planet. The agency will continue to develop and conduct critical tests on the James Webb Space Telescope leading to its planned launch in 2018. As the successor to the Hubble Space Telescope, James Webb again will revolutionize our understanding of the universe. NASA also is developing an integrated strategy to ensure the next steps for the robotic Mars Exploration Program will support science as well as long-term human exploration goals.

Space Technology work supported in the budget will drive advances in new high-payoff space technologies such as laser communications and zero-gravity propellant transfer, seeding innovation that will expand our capabilities in the skies and in space, supporting economic vitality, lowering the cost of other government and commercial space activities, and helping to create new jobs and expand opportunities for a skilled workforce.

NASA supports its commitment to enhancing aviation safety and airspace efficiency, and reducing the environmental impact of aviation by helping to accelerate the nation's transition to the Next Generation Air Transportation System through investments in revolutionary concepts for air vehicles and air traffic management.

"The 2013 budget moves us forward into tangible implementation of a sustainable and affordable exploration program," NASA's Chief Financial Officer Elizabeth Robinson said.

The NASA budget and supporting information are available at <http://www.nasa.gov/budget>.

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Marshall Director Anticipates 'Steady Path' as NASA Unveils Proposed 2013 Budget

By Rick Smith

Immediately following [NASA's unveiling](#) of the agency's proposed fiscal year 2013 budget Feb. 13, NASA Deputy Administrator Lori Garver and Marshall Space Flight Center Director Robert Lightfoot addressed the center workforce, discussing expectations for the year ahead. Lightfoot's final analysis? The proposed budget puts the center on "a steady path" to success in all its varied, critical endeavors for the agency.

Image left: Marshall Center Director Robert Lightfoot, left, and NASA Deputy Administrator Lori Garver address the Marshall workforce Feb. 13. (MSFC/Emmett Given)



President Barack Obama has proposed a \$17.71 billion budget for NASA. The Marshall Center's portion includes strong allocations for exploration, science and space operations, including a sizeable increase in space technology funding to support efforts such as the [Technology Demonstration Missions](#) and [Centennial Challenges](#), key activities Marshall manages for the agency.

Among the standout elements of the new budget is funding allocated for planned construction projects across Marshall, Lightfoot said -- many of which are expected to support long-term work on the Space Launch System and other exploration efforts. More importantly, construction of Marshall's next-generation "campus" will help slash Marshall's operating costs, he said. By replacing antiquated, expensive-to-maintain buildings with new, energy-efficient facilities, such as Marshall's 4600 Engineering Complex and the new facility now under construction in the 4200 complex, the center can save up to 65 percent on facility heating, power and maintenance costs, Lightfoot said. That fact will dramatically improve Marshall's bottom line beyond the next fiscal year, he noted.

Garver said she and NASA Administrator Charles Bolden are optimistic about the future. "We truly believe this [budget] is an investment that will allow us to carry out programs in the best possible way and reach our goals," she said. She emphasized that NASA's leadership has "very good support from the White House and Capitol Hill" and will continue to work hard to further the long-term interests of the nation.

"We are all about doing the cutting-edge things that no one else can do," she told the Marshall team assembled in Morris Auditorium and watching live on [Desktop TV](#). "I couldn't be more proud to share with you the confidence we have in you."

The budget proposal next goes to Congress for review. For a comprehensive breakout of the NASA budget, visit <http://www.nasa.gov/budget>.

Smith, an AI Signal Research Inc. employee, supports the Office of Strategic Analysis & Communications.

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Space Launch System Issues NASA Research Announcement for Advanced Booster Risk Reduction Solutions

By Amie Cotton



On Feb. 9, the Marshall Space Flight Center issued a NASA Research Announcement for the Space Launch System advanced booster risk-reduction effort. Proposals will provide an advanced booster concept with the goal of reducing risk in the areas of affordability, reliability and performance. Proposals will identify and mitigate liquid or solid booster technical risks and provide related hardware demonstrations as well as identify high-risk areas associated with adaptation of advanced booster technology to SLS.

Image left: Artist rendering of the Space Launch System (NASA/MSFC)

Marshall is leading the design and development of the SLS on behalf of the agency. The new heavy-lift launch vehicle will expand human presence beyond low-Earth orbit and enable new missions of exploration across the solar system.

The 130-metric-ton, evolved SLS vehicle will require an advanced booster with a significant increase in thrust over existing U.S. liquid or solid boosters.

"These risk-reduction efforts will set the course for the full-scale design and development of this new advanced booster," said Chris Crumbly, SLS Advanced Booster NASA Research Announcement evaluation team chair. "We're excited to see what innovative solutions industry will provide as we embark on this new capability -- enabling unprecedented missions beyond low-Earth orbit."

NASA anticipates making multiple awards in response to this solicitation, and anticipates \$200 million total funding. Final awards will be made based on the strength of proposals and availability of funds. The deadline for submitting proposals is April 9. The anticipated period of performance for any contracts awarded as a result of this NRA is not expected to exceed 30 months and will have an effective date of Oct. 1, 2012.

This NRA is the second part of a three-part plan that includes risk-reduction planning prior to Design, Development, Testing and Evaluation of the advanced boosters.

To view the announcement and instructions for submissions, visit <http://prod.nais.nasa.gov/cgi-bin/eps/synopsis.cgi?acqid=149821>.

For information about NASA's Space Launch System, visit <http://www.nasa.gov/sls>.

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NASA, Industry and Academia Discuss Space Launch System Advanced Development

Mindy Niedermeyer, chair of the Space Launch System Advanced Development NASA Research Announcement, addresses more than 115 people representing 48 companies and universities during the SLS Advanced Development Industry and Academia Day on Feb. 14 in Building 4200, Morris Auditorium. The Marshall Space Flight Center is leading the design and development of the SLS on behalf of the agency. The new heavy-lift launch vehicle will expand human presence beyond low-Earth orbit and enable new missions of exploration across the solar system. Marshall is issuing a NASA Research Announcement to solicit proposals for advanced development work on SLS in the areas of concept development, propulsion, structures, materials, manufacturing and avionics, and software. These efforts will focus on affordability and sustainability of the SLS as it evolves from the 70-metric-ton vehicle to the 130-metric-ton vehicle. The draft NASA Research Announcement was issued Feb. 9 and is available at <http://prod.nais.nasa.gov/cgi-bin/eps/synopsis.cgi?acqid=149821>. The final NRA is scheduled for release in March. (NASA/MSFC)



Robert Lightfoot, right, director of the Marshall Space Flight Center, greets Dr. Eun Kim, left, chief engineer for the Affordable Upper Stage Engine Program for Aerospace Corp., and Capt. Chris McGraff, center, deputy of the Affordable Upper Stage Engine Program for the Air Force's Space & Missile Center Launch Systems Directorate, at the Space Launch System Advanced Development Industry and Academia Day Feb. 14 at Marshall. (NASA/MSFC)

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Incident and Injury-Free: Redefining Safety Through Conversation

By *Sanda Martel*

Marshall Space Flight Center's leadership strives to create a workplace culture in which each employee contributes to the NASA mission and then returns safely to his or her family and loved ones at the end of each day.

Image left: Attending a recent Incident and Injury-Free workshop are, front table, from left, Jim Lomas and Carl Buff; and in the back, from left, Debbie Stone, Janice Stuart, Joe Hale and Don Chenevert. (NASA/MSFC/Ray Downward)



One of the center's core values is an intolerance of risk to an individual's health, safety or well-being while performing work assignments and duties. To support this value, Marshall has adopted an Incident and Injury-Free paradigm approach for thinking about health and well-being. The initiative's fiscal year 2012 goal is to include each employee in a conversation about what it takes to make safety and well-being personal, relevant and important.

"We don't want anyone to get hurt at Marshall, but not because of a metric or some number we are trying to achieve," said Robert Lightfoot, director of the Marshall Center. "Instead, we want to renew our commitment to caring about our co-workers and the impact of an injury on the individual, their families and co-workers," he added.

Incident and Injury-Free is a commitment to act on what is most important -- safety and well-being. It embraces dignity and respect for people and the environment and involves taking personal responsibility for what happens, the courage to care and talking about positive outcomes.

"Incident and Injury-Free is built on people who act from deeply held values in a culture focused on creating a healthy and harm-free environment," said Roy Malone, manager of the Shuttle-Ares Transition Office. Malone and Steve Cash, manager of the Safety and Mission Assurance Directorate, are helping to champion the Incident and Injury-Free approach to safety and well-being at Marshall.

All civil service and contractor employees are invited to attend an Incident and Injury-Free workshop, a four-hour conversation led and facilitated by Marshall employees. Each participant will consider and examine his or her own relationship to safety and well-being, and work with fellow employees to elevate collective awareness levels at Marshall.

"These workshops strive to make us think differently about the safety and well-being of our team," Lightfoot said.

"If we think about workplace safety as, 'Oh no, another safety moment to sit through,' or, 'my name is up on rotation and I have to rack my brain for a safety topic presentation,' maybe it's time to reassess and regroup," said Malone. "It's time to make safety, health and well-being a conversation -- with yourself and with your co-workers; time to decide how to make safety personal, relevant and important," he added.

To register for a workshop, visit Inside Marshall and look for the Incident and Injury-Free icon. Sessions are being held Feb. 16, 22, 23, 28, 29 and March 1, 6, 7, 8, 13, 14, 15, 20, 21, 22, 27, 28, 29.

Martel, an AI Signal Research Inc. employee, supports the Office of Strategic Analysis and Communications.

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NASA Seeks Proposals for Green Propellant Technology Demonstrations

NASA news release



NASA is seeking technology demonstration proposals for green propellant alternatives to the highly toxic fuel hydrazine. As NASA works with American companies to open a new era of access to space, the agency seeks innovative and transformative fuels that are less harmful to our environment.

Image left: Artist's image of a satellite in orbit. Satellites run off a highly toxic fuel called hydrazine. NASA seeks proposals for green propellant alternatives to the highly toxic fuel. (NASA)

Hydrazine is an efficient and ubiquitous propellant that can be stored for long periods of time, but is also highly corrosive and toxic. It is used extensively on commercial and U.S. Department of Defense satellites, as well as for NASA science and exploration missions. NASA is looking for an alternative that decreases environmental hazards and pollutants, has fewer operational hazards and shortens rocket launch processing times.

"High-performance green propulsion has the potential to significantly change how we travel in space," said Michael Gazarik, director of NASA's Space Technology Program at the agency's headquarters in Washington. "NASA's Space Technology Program seeks out these sorts of cross-cutting, innovative technologies to enable our future missions while also providing benefit to the American space industry. By reducing the hazards of handling fuel, we can reduce ground processing time and lower costs for rocket launches, allowing a greater community of researchers and technologists access to the high frontier."

Beyond decreasing environmental hazards and pollutants, promising aspects of green propellants also include reduced systems complexity, fewer operational hazards, decreased launch processing times and increased propellant performance.

Maturing a space technology, such as green propellants, to mission readiness through relevant environment testing and demonstration is a significant challenge from a cost, schedule and risk perspective. NASA has established the Technology Demonstration Missions Program to perform this function, bridging the gap between laboratory confirmation of a technology and its initial use on an operational mission.

NASA anticipates making one or more awards in response to this solicitation, with no single award exceeding \$50 million. Final awards will be made based on the strength of proposals and availability of funds. The deadline for submitting proposals is April 30.

The Technology Demonstration Missions Program is managed by the Marshall Space Flight Center. To view the announcement and instructions for submissions, visit <http://go.usa.gov/Qbx>.

For more information about NASA's Space Technology Program and Technology Demonstration Missions, visit <http://www.nasa.gov/oct>.

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Marshall Center's Debrah Underwood Honored with MOMENTUM Woman of Inspiration Award

By Megan Davidson

Debrah Underwood, manager of the Resource Management Office in the Mission Operations Laboratory at the Marshall Space Flight Center, will receive the MOMENTUM Woman of Inspiration Award for her contributions to the advancement of women in leadership roles and to the community.

MOMENTUM is leadership program that helps to empower a diverse group of women to develop leadership skills that positively impact business, culture and politics in Alabama. Underwood will receive her award Feb. 29 at the MOMENTUM awards ceremony in Birmingham.

She was nominated for the award by her daughter, Rachel Underwood. "My mom has greatly influenced the lives of her children, as well as the lives of her coworkers and employees," Rachel Underwood said. "She is a great encourager of doing your best and achieving the most you can with the assets you have. She is diligent in seeking out the right person for the right job and seeing that they have the training and education they need and desire. She loves watching a person's growth and development into the person they want to become."



Debrah Underwood (NASA/MSFC)

Debrah Underwood, formerly Debrah Brazil, moved to Huntsville from San Francisco with her family in 1963. After graduating from Lee High School in 1968, she attended the University of Alabama in Huntsville, where she met her husband, Daniel. After having their first child, Nathan, she went back to school and graduated in 1973 with a bachelor's degree in science education from Memphis State University in Tennessee. She taught high school and middle school science courses at private Baptist and Hebrew academies for two-and-a-half-years before accepting a science position in 1976 at the Marshall Center. Since then, her responsibilities have continued to grow, primarily in the area of mission operations and support.

Until 1980, she worked on data analysis for Landsat -- NASA-managed satellites that collect information about Earth from space -- and learned to do launch and landing loads analysis for the Space Shuttle Program. From 1980 to 1990, she was given the opportunity to work on several Spacelab missions. She led training efforts for crew and ground support personnel and conducted air-to-ground communications with the astronauts performing the scientific payload activities during those missions. She was also a support diver in NASA's Neutral Buoyancy Tank and a payload researcher on NASA's KSC-135 aircraft, both simulating the effects of zero gravity.

From 1990 to 1995, she was a Spacelab Payload Operations director, managing all pre-mission planning activities including mission timeline development, command and control planning and payload training. During the mission execution phase, she was responsible for all real-time payload activities -- reporting directly to the flight director at Johnson Space Center's Mission Control Center and managing the activities of the Payload Operations Control Center in Huntsville.

She was the branch chief and then division chief for Marshall's Training and Crew Systems organizations from 1995 to 2004. In her current position -- which she assumed in 2006 after working in a lab staff position for two years -- she is responsible for the Mission Operations Laboratory's manpower, budget, contracts, personnel administration and management process development and documentation.

Underwood also serves the community: She served on the City of Madison's Disability Advisory Board for two years, helping to improve the quality of life for those with disabilities. Helping people with disabilities is close to Underwood's heart, as her eldest daughter, Leah, was born with the neurological disorder tuberous sclerosis. The condition causes seizures, delayed development and many other health issues. She also is an active member of the First Baptist Church of Madison, where she teaches an adult Sunday school class.

"My mom has been an inspiration to me, my friends and family, our community and her coworkers at Marshall," her daughter said. "I believe she encompasses all the qualities a 'Woman of Inspiration' should have -- intelligence, charisma, strong morals, kindness, generosity, passion and ambition."

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Marshall Center to Celebrate Black History Month throughout February

By Megan Davidson



Freeman Hrabowski III (Photo Courtesy)

The Marshall Space Flight Center will commemorate Black History Month with several events in February.

Team Redstone -- which includes the Marshall Center and U.S. Army organizations on Redstone Arsenal -- will host a Black History Month observance program at 10 a.m. Feb. 15 in Bob Jones Auditorium at the Sparkman Center, Building 5304. Guest speaker will be Dr. Crystal Kuykendall -- a public speaker, former educator, author and legal analyst. Awards for the Black History Month essay and display contests also will be presented at the program.

Freeman Hrabowski III, president of the University of Maryland, Baltimore County, will be the keynote speaker at Marshall's Black History Month program Feb. 16. The event -- open to all Marshall Center team members -- will be held from 10-11:30 a.m. in Building 4200, Morris Auditorium. His topic will be "Preparing Americans for Innovation and Collaboration for America's STEM Workforce."

Born in Birmingham, Hrabowski has served as president of the University of Maryland, Baltimore County, since 1992. His research and publications focus on science and math education, with special emphasis on minority participation and performance. He serves as a consultant to the National Science Foundation, the National Institutes of Health, the National Academies, and universities and school systems nationally.

As a child, Hrabowski was an activist during the civil rights movement, and was featured in Spike Lee's 1997 documentary, "Four Little Girls," about the 1963 racially motivated bombing of Birmingham's Sixteenth Street Baptist Church.

Hrabowski has received many honors during his career. In 2011, he received the Teachers Insurance and Annuity Association and College Retirement Equities Fund's Theodore M. Hesburgh Award for Leadership Excellence; and the Carnegie Corporation of New York's Academic Leadership Award -- recognized by many as the nation's highest awards among higher-education leaders. He also was named one of seven "Top American Leaders" in 2011 by The Washington Post and the Harvard Kennedy School's Center for Public Leadership. In 2009, Time magazine named him one of America's "10 Best College Presidents." In 2008, he was named one of "America's Best Leaders" by U.S. News & World Report.

On Feb. 22, the Marshall Center will host a Black History Month lunch-and-

learn event from 11:30 a.m. to 12:30 p.m. in Building 4200, Room 504. The guest speaker will be Dr. Harry Hobbs, communications relations officer at the Huntsville Police Department. His topic will be "Bridge Building: Creating an Inclusive Community."

Hobbs has an extensive military career, serving in the U.S. Army from 1978 to 2007. He is the recipient of numerous military honors, including the Legion of Merit -- awarded for exceptionally meritorious conduct in the performance of outstanding services and achievements; and the Bronze Star Medal, awarded for bravery, acts of merit or meritorious service.



Harry Hobbs (Photo Courtesy)

He was selected as the "Mentor of the Year" in 2011 by the Greater Huntsville Chapter of 100 Black Men of America for his commitment to working with youth. Mentoring is the cornerstone of the organization's purpose, which is to encourage at-risk black males to be educated, healthy and contributing members of society.

The Black History Month events are sponsored by Marshall's Office of Diversity & Equal Opportunity.

For more information about Kuykendall, visit <http://crystalkuykendall.com/>

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NASA's Chandra Finds Milky Way's Black Hole Grazing On Asteroids

NASA news release



The giant black hole at the center of the Milky Way may be vaporizing and devouring asteroids, which could explain the frequent flares observed, according to astronomers using data from NASA's Chandra X-ray Observatory.

Image left: Supermassive black hole Sagittarius A* at the center of the Milky Way. (X-ray: NASA/CXC/MIT/F. Baganoff et al.; Illustrations: NASA/CXC/M.Weiss)

For several years, Chandra has detected X-ray flares about once a day from the supermassive black hole known as Sagittarius A*, or Sgr A* for short. The flares last a few hours, with brightness ranging from a few times to nearly 100-times that of the black hole's regular output. The flares also have been seen in infrared data from the European Southern Observatory's Very Large Telescope in Chile.

"People have had doubts about whether asteroids could form at all in the harsh environment near a supermassive black

hole," said Kastytis Zubovas of the University of Leicester in the United Kingdom, and lead author of the report appearing in the Monthly Notices of the Royal Astronomical Society. "It's exciting because our study suggests that a huge number of them are needed to produce these flares."

Zubovas and his colleagues suggest there is a cloud around Sgr A* containing trillions of asteroids and comets, stripped from their parent stars. Asteroids passing within about 100 million miles of the black hole, roughly the distance between the Earth and the sun, would be torn into pieces by the tidal forces from the black hole.

These fragments then would be vaporized by friction as they pass through the hot, thin gas flowing onto Sgr A*, similar to a meteor heating up and glowing as it falls through Earth's atmosphere. A flare is produced and the remains of the asteroid are swallowed eventually by the black hole.

"An asteroid's orbit can change if it ventures too close to a star or planet near Sgr A*," said co-author Sergei Nayakshin, also of the University of Leicester. "If it's thrown toward the black hole, it's doomed."

The authors estimate that it would take asteroids larger than about six miles in radius to generate the flares observed by Chandra. Meanwhile, Sgr A* also may be consuming smaller asteroids, but these would be difficult to spot because the flares they generate would be fainter.

These results reasonably agree with models estimating how many asteroids are likely to be in this region, assuming that the number around stars near Earth is similar to the number surrounding stars near the center of the Milky Way.

"As a reality check, we worked out that a few trillion asteroids should have been removed by the black hole over the 10-billion-year lifetime of the galaxy," said co-author Sera Markoff of the University of Amsterdam in the Netherlands. "Only a small fraction of the total would have been consumed, so the supply of asteroids would hardly be depleted."

Planets thrown into orbits too close to Sgr A* also should be disrupted by tidal forces, although this would happen much less frequently than the disruption of asteroids, because planets are not as common. Such a scenario may have been responsible for a previous X-ray brightening of Sgr A* by about a factor of a million about a century ago. While this event happened many decades before X-ray telescopes existed, Chandra and other X-ray missions have seen evidence of an X-ray "light echo" reflecting off nearby clouds, providing a measure of the brightness and timing of the flare.

"This would be a sudden end to the planet's life, a much more dramatic fate than the planets in our solar system ever will experience," Zubovas said.

Very long observations of Sgr A* will be made with Chandra later in 2012 that will give valuable new information about the frequency and brightness of flares and should help to test the model proposed here to explain them. This work could improve understanding about the formation of asteroids and planets in the harsh environment of Sgr A*.

The Marshall Space Flight Center manages the Chandra program for NASA's Science Mission Directorate in Washington. The Smithsonian Astrophysical Observatory controls Chandra's science and flight operations from Cambridge, Mass.

For Chandra images, multimedia and related materials, visit <http://www.nasa.gov/chandra>.

For an additional interactive image, podcast, and video on the finding, visit <http://chandra.si.edu>.

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NASA has selected COLSA Corp. of Huntsville for its Huntsville Operations Support Center, or HOSC, contract. The estimated value of the contract, including all options, is approximately \$94.6 million.

COLSA will provide engineering, operations and maintenance, system development services and tools for the International Space Station and other program and project mission services.

The HOSC services contract has a potential period of performance of five years and is a small business set-aside. The contract begins April 1 with an 18-month base period, followed by three one-year options and one six-month option that may be exercised at NASA's discretion. It is a cost-plus-award-fee contract.

Under the contract, COLSA will perform its services both locally and remotely to support NASA spacecraft, payload, satellite, and propulsion systems operations services. COLSA will furnish all resources, including management, personnel, equipment and supplies, unless specific exceptions are made by the government.

Other members of the COLSA team include Computer Sciences Corp. of Lanham, Md., and QTEC Inc. of Huntsville.

Find this article at:

<http://www.nasa.gov/centers/marshall/about/star/index.html>